CLAIMS

We claim:

5   1. A method of informing a vehicle operator to improve the operator's performance, the method comprising the steps of:

receiving vehicle operating data from the vehicle relating to the vehicle operating condition;

monitoring an interior portion of the vehicle and receiving operator

10   activity data from the interior portion of the vehicle relating to activities of the operator within the interior portion;

receiving vehicle environment data from the environment external to the vehicle;

monitoring the vehicle operator and receiving operator condition data

15   relating to a condition of the vehicle operator;

estimating an operator cognitive load; and

prioritizing vehicle information based upon the operator cognitive load for selectively informing the operator of the vehicle information.

20   2. The method of claim 1, wherein the step of estimating an operator cognitive load comprises synthesizing and summarizing the vehicle operating data, the operator activity data, the environment data and the operator condition data.

3. The method of claim 2, wherein the step of synthesizing and summarizing

25   comprises providing a sensor fusion apparatus within the vehicle.

4. The method of claim 2, wherein the step of synthesizing and summarizing comprises determining existence of at least one of: a problem condition, a problem correction, a problem exacerbation, an operator task requirement, an

30   agent task requirement, completion of an operator task, completion of an agent task and a situation change.

5. The method of claim 1, wherein the step of prioritizing vehicle information comprises determining existence of an operator task and requesting operator response to the operator task.

6. The method of claim 1, wherein the vehicle information comprises either of an alert and a warning.

7. The method of claim 1, the method further comprises receiving operator history data, and wherein the step of estimating operator cognitive load comprises estimating operator cognitive load based in part on the operator history data.

8. The method of claim 1, the method further comprises receiving operator preference data, and wherein the step of estimating operator cognitive load comprises estimating operator cognitive load based in part on the operator preference data.

10. A method of providing information to an operator of a vehicle, the method comprising the steps of:

generating a master condition list, the master condition list being a fusion of sensor data within the vehicle;

determining an operating situation of the vehicle based on the master condition list; and

prioritizing information presented to the operator based upon the operating condition.

11. The method of claim 10, wherein the operating situation comprises one of: a problem condition, a problem correction, a problem exacerbation, an operator task requirement, an agent task requirement, completion of an operator task, completion of an agent task and a situation change.

12. An apparatus for providing information to an operator of a vehicle, the apparatus comprising:

a sensor fusion module, the sensor fusion module being coupled to a vehicle condition sensor, a vehicle exterior sensor, an operator condition sensor and an operator activity sensor respectively providing to the sensor fusion module vehicle condition data, vehicle environment data, operator condition data and operator activity data, the sensor fusion module operable to provide a master condition list based on the data received by the sensor fusion module;

a response selector coupled to the sensor fusion module, the response selector being operable to determine a current operating condition based upon the master condition list and to assess an operator action in response to the current operating condition to provide an operator performance assessment value based upon the master condition list and the operator action; and

an action generator coupled to the response selector to generate an indication; and

an operator interface coupled to the action generator to convey the indication to the operator.

13. The apparatus of claim 12, wherein the vehicle condition data comprises at least one of: vehicle speed, vehicle acceleration, throttle application, brake application, steering wheel input, throttle position, rate of change of throttle position, additional available throttle input, throttle applicator pressure, brake position, rate of change of brake position, additional available brake input, brake applicator pressure, steering wheel position, rate of change of the steering wheel position, operator pressure applied to the steering wheel and additional available steering input.

14. The apparatus of claim 12, wherein the operator activity data comprises usage data relating to at least one of driving controls, telematics controls, occupant comfort controls, infotainment controls and communication controls.

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14. The apparatus of claim 12, wherein the operator condition data comprises data relating to at least one of fatigue, intoxication and distraction.

15. The apparatus of claim 12, wherein the vehicle environment data comprises data relating to at least one of road condition, lane following, headway, traffic control and traffic condition.

16. The apparatus of claim 12, wherein indication comprises at least one of a visual indication, an audio indication and a haptic indication.

17. The apparatus of claim 12, wherein the indication comprises a pre-recorded message.

18. The apparatus of claim 12, wherein the indication comprises prioritized information.

19. The apparatus of claim 12, wherein the indication conveys one of an operator task and an agent task.

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